The Bristol Medico-Chirurgical Journal

"Scire est nescire, nisi id me Scire alius sciret."

AUTUMN, 1938.

SOME PROBLEMS IN THE DIAGNOSIS AND TREATMENT OF INTRA-CRANIAL TUMOURS.

BY

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THREE main questions have to be answered in any suspected case of intra-cranial tumour. In some cases the answers are obvious, while in others even the most elaborate means of investigation may fail to provide a full answer. Yet the neuro-surgeon's aim should be to provide full answers where possible, as only then is he in a position to decide the best line of treatment.

1. Is there a tumour?
2. Where is the tumour?
3. What is the nature of the tumour?

In reference to this article a "tumour" is considered as any "space-occupying lesion" and, of course, may vary from the most benign cyst, through

the low-grade malignancy tumours, to neoplasms of a very high-degree malignancy. The term "space-occupying lesion" is, however, somewhat clumsy, and the word "tumour" will be used instead in this paper.

The classical signs of an intra-cranial tumour as detailed in many medical text-books are :—headache, vomiting and papillœdema. It cannot be over-emphasized that these are not the symptoms of a tumour *per se*, but those of a raised intra-cranial pressure (often from a tumour) and are usually signs of an advanced state of affairs. It is true that in some cases raised tension occurs early and in others that one or other of the classical signs appear from other causes. The important point is that the practitioner should not wait for these signs before referring his patient to the specialist. He might as well refuse to diagnose appendicitis until there is generalized abdominal rigidity, or cancer of the breast until there is loss of weight.

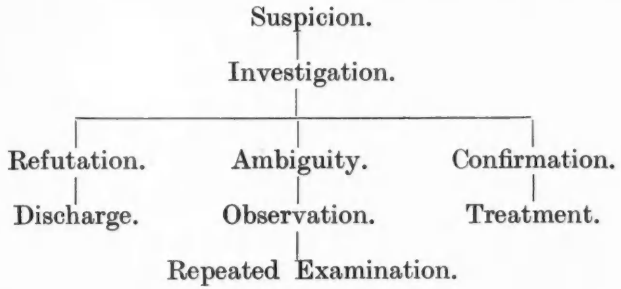
This point is stressed because raised tension increases the surgeon's difficulties in diagnosis and treatment, and vastly increases the risks of operation.

A parallel might well be drawn with senile enlargement of the prostate, thus :—

Senile Enlargement of the Prostate.	Intra-Cranial Tumour.
↓	↓
Local Urinary Dysfunction.	Local Neural Dysfunction.
↓	↓
General Urinary Dysfunction. Uræmia.	General Intra-Cranial Pressure.
↓	↓
Coma and Death.	Coma and Death.

The true signs of a tumour are the signs of local deterioration of cerebral function, a tumour being essentially a destructive agent. "Cerebral insults" is a useful descriptive term for many of these attacks of destruction of function. To these insults may be added epileptiform attacks. These two signs form the essential features of an intra-cranial tumour. As, however, many of these tumours lie in silent areas of the brain, the essential focal symptoms may not be apparent until signs of increased tension are well marked.

The diagnosis of an intra-cranial lesion follows the general principles of medical investigation, thus :—



Clearly the problem for the practitioner is one of suspicion. All vague, odd neurological cases must be suspect. Migraine, fits, strokes, giddiness, failing vision, hysteria, etc., should all be considered as potential tumour cases and at least worthy of investigation.

METHODS OF INVESTIGATION.

These may be summarized in the following manner :—

1. General neurological examination.
2. Examination of the fields of vision. Perimetry.
3. Manometric and laboratory examination of the cerebro-spinal fluid.
4. Plain and stereoscopic X-ray views.
5. Encephalography.
6. Ventriculography.
7. Arteriography.
8. Electroencephalography.

Roughly speaking, it may be said that the first three are the province of the neurologist and of the pathologist, the last five the province of the radiologist and of the neuro-surgeon. It is not proposed to deal further with the first three except to acknowledge their paramount importance, and to stress that the other investigations are rightly termed accessory investigations. One point may, however, be stressed—the use of the manometer in lumbar puncture. This little instrument is an essential adjunct to lumbar puncture. To estimate cerebro-spinal pressure by allowing fluid to drop from a lumbar puncture needle is about as accurate and scientific as estimating the red cell count by looking at the lower conjunctival recess; and alas, it is far more dangerous. Manometry is simple, safe and informative, and should be the routine procedure. (Fig. 1.)

Plain X-rays do not commonly give direct information as to the situation of cerebral tumours. Much indirect evidence is, however, often afforded. Hammer markings of the skull, separation of the sutures, alterations of the clinoid processes and sella turcica, erosion of bone, hyperostosis, alterations in vascular

PLATE VI

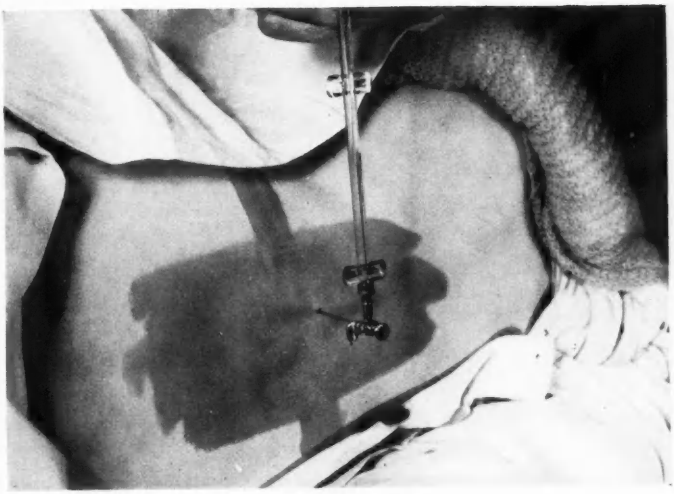


FIG. 1.

The correct way to perform lumbar puncture, *i.e.*, with a manometer.

FIG. 2.

Intra-cranial calcification in a supra-sellar cyst. Successful relief of symptoms by operation.

(Case by courtesy of Dr. Orr Ewing. Skiagram by courtesy of Dr. Bush.)

PLATE VII

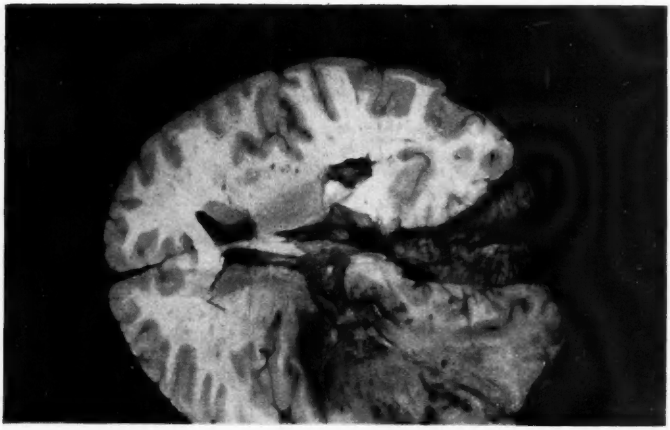


FIG. 3.

Unilateral calcification in the choroid plexus, embedded in a huge glioblastoma multiforme.

(Specimen by courtesy of Dr. Fraser.)

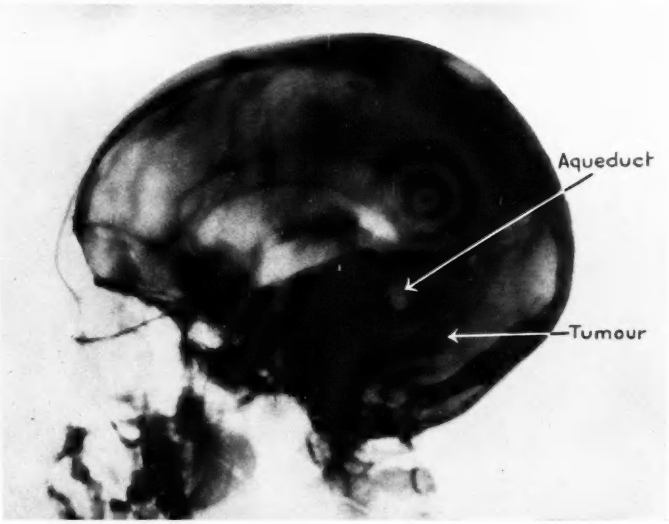


FIG. 4.

Ventriculogram.

Intra-ventricular tumour, fourth ventricle. Note the distended aqueduct of sylvius and the air around the shadow in the fourth ventricle.

(Film by Dr. Mayes. Author's case, with Dr. Todd.)

markings, changes in the optic foramina and internal auditory meatus, may all hold peculiar significance. (Fig. 2.) Of especial interest is pineal calcification. Over the age of forty years most pineal glands are sufficiently calcified to be radiopaque. The shadow is normally strictly midline. Deviations to right or left surely indicate a lesion on the opposite side. There is, however, a pitfall here in that spontaneous calcification occasionally occurs in the choroid plexus in the vestibular region. This is normally bilateral and about an inch from the midline. When unilateral (as in a recent case) confusion may occur, and what is assumed to be a calcified pineal displaced from the midline is really choroid plexus. (Fig. 3). In the majority of cases, however, location will not yet have been obtained and more exact accessory measures are required.

ENCEPHALOGRAPHY AND VENTRICULOGRAPHY.

With very few exceptions, "space-occupying lesions" within the cranial cavity distort or displace the ventricular system. Normally the ventricular cavities and their contents are of the same degree of radio-translucency as the brain, and thus do not appear on an X-ray. If, however, the cerebro-spinal fluid be withdrawn and replaced by air a contrast is obtained, and the ventricular outlines may be studied. The fluid may be drawn off and air replaced in either of two ways: via the lumbar subarachnoid puncture—encephalography; or by direct ventricular tap—ventriculography. Encephalography can only be employed when there is no rise of intra-cranial tension; if any real rise be present encephalography is far too

dangerous. The method has the advantage of not being an "operation" and is simple, but it is unfortunately an extremely unpleasant experience for the patient. Severe headache, nausea, vomiting and some collapse almost always occur and may last for two or three days.

Ventriculography is more of an operation, in that a burr hole has to be made in the skull. (Fig. 4.) Except in extreme cases, however, the after effects are not so unpleasant. If there is much tension and much ventricular displacement, there may be a sudden exacerbation of symptoms after ventriculography, and this operation must never be performed unless the surgeon is prepared to proceed to a decompression if necessary. (Figs. 5 to 8.) There is an increasing tendency to make the ventriculography the first stage in the treatment of any case, and as soon as the films have been studied to proceed to the major operation without delay. It is hoped in this way to avoid unpleasant reactions.

A MAJOR NEURO-SURGICAL PROBLEM.

"To refuse the evil and choose the good."—*Isa.* vii. 16.

Selection of cases based on pre-operative information is the ideal of the neuro-surgeon, but frequently he has to fall far short of this aim and to perform exploratory operations. Here the difficulties are manifest. No surgeon performs a laparotomy for carcinoma of the stomach when he can feel metastases in the liver, or amputation of the breast when there are secondary deposits in the spine. No surgeon performs a resection of gut and anastomosis in the

PLATE VIII

FIG. 5.

FIG. 6.

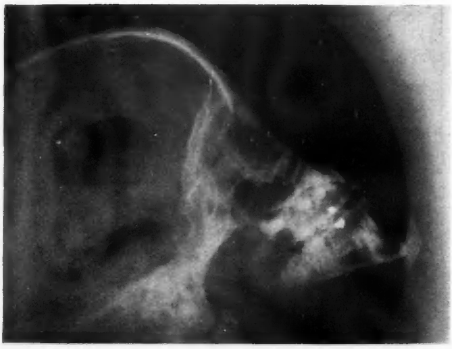


FIG. 7.

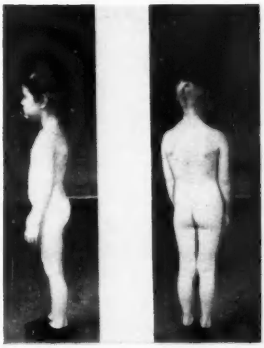


FIG. 8.

Ventriculograms showing symmetrical hydrocephalus in a child with a cerebellar tumour. The child after operation. Note the filling of the third ventricle.

(Author's case. Films by Dr. Orley.)

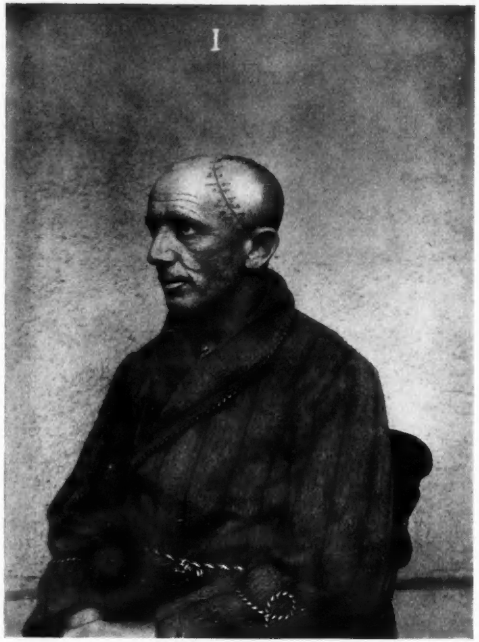


FIG. 9.

FIG. 10.

The right and the wrong way to deal with irremoveable tumours.

1. *Wrong.* Huge decompression cerebral hernia rapidly developing. (Patient was aphasic and remained so after the operation for six months.)

2. *Right.* The bone flap is replaced, the scar in the hair line, and no one could tell he has had a brain operation.

presence of intestinal obstruction (if strangulation be excepted). He will drain the bowel and at a later date perform his resection. No surgeon removes the prostate in the presence of uræmia: he will drain the bladder and await improvement. But in analogy this is precisely what the neuro-surgeon may have to do. He cannot with sufficient accuracy determine whether his case is inoperable until he has operated, and thus the position is too late for a retracement of steps. Most neuro-surgeons are agreed that tumours of the type glioblastoma multiforme are so malignant, so liable to recur locally after free removal, that knowingly they will not operate on these cases. The maximum survival period is three to four months after such operations, and their performance is probably not justifiable. If an operation is performed and the tumour is not removed an enormous cerebral hernia develops, and the patient leads an unhappy, partially paralysed, vegetable type of existence. In fact he may suffer more from his cerebral hernia than from the original rapidly developing tumour. (Fig. 9.)

If the skull has been opened and such a tumour found the best course is free excision until the bone flap can be replaced firmly without tension, and the patient thus secured against a hernia. (Fig. 10.) If the tumour is in an active area of the brain such extirpation will lead to pitiful paralysis. Thus it can be readily seen that the surgeon's best course is to refuse these bad cases if he can detect them. There is the rub. In the absence of exact preoperative knowledge one is bound to explore on the chance that the tumour is more benign in nature. If the surgeon does not explore he

1. *Wrong.* Huge decompression cerebral hernia rapidly developing. (Patient was aphasic and remained so after the operation for six months.)
2. *Right.* The bone flap is replaced, the scar in the hair line, and no one could tell he has had a brain operation.

may watch his "hopeless" case die and then find that the patient had a relatively benign and accessible lesion.

CAN FURTHER EXACT KNOWLEDGE BE OBTAINED?

Two other preoperative investigations are possible: arteriography and electroencephalography. The latter examination lies outside the detailed knowledge of the writer, but it is certain that it can throw no light on the nature of the underlying lesion. Electroencephalography gives with considerable exactness information as to damage to cortical function, but no information as to the cause of the damage, which may be vascular disease, inflammatory lesion or tumour.

Arteriography, however, is worthy of further consideration. Intra-cranial tumours displace and distort the cerebral blood vessels, and information as to localization may be obtained from a study of such displacement. (Figs. 11 to 14). But, further, the tumour may have a circulation peculiar to itself of new-formed vascular spaces, or the tumour may alter the normal circulation in some intimate way so that the actual pathology of the tumour may be predicted. Of course, this is not regularly possible, but it is sufficiently frequent to make the method worthy of use and further study. Meningiomas, angiomas and aneurysms may be diagnosed by this means with confidence. This is a valuable step, as the meningiomas are an exceedingly favourable class, while an aneurysm does not require an intra-cranial operation, but ligature of the corresponding carotid artery.

Briefly, arteriography consists in X-ray visualization

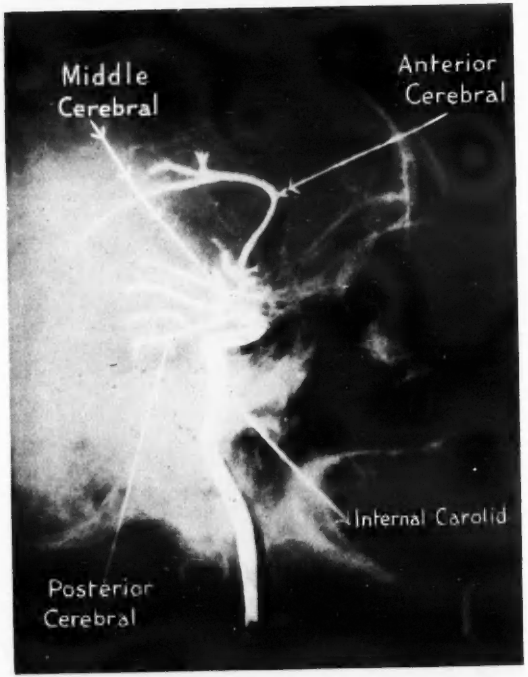


FIG. 11.

Normal arteriogram. Retouched to show the principal vessels.

(Author's case. By courtesy of Dr. Clarke. Film kindly retouched by Mr. W. A. Jackman.)

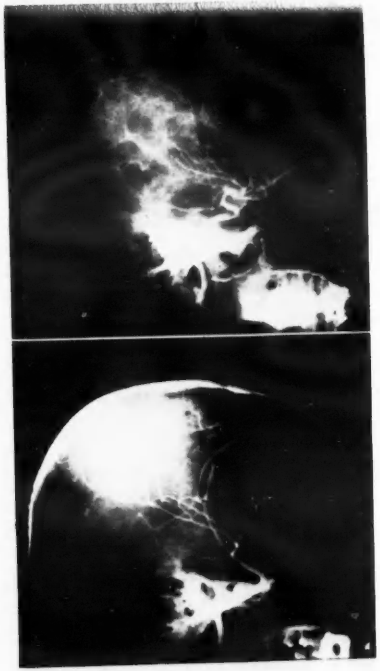


FIG. 12.

Arteriograms.

1. *Above.* Hydrocephalus from subtentorial tumour.

2. *Below.* Frontal tumour. Note the distortion of the vessels.

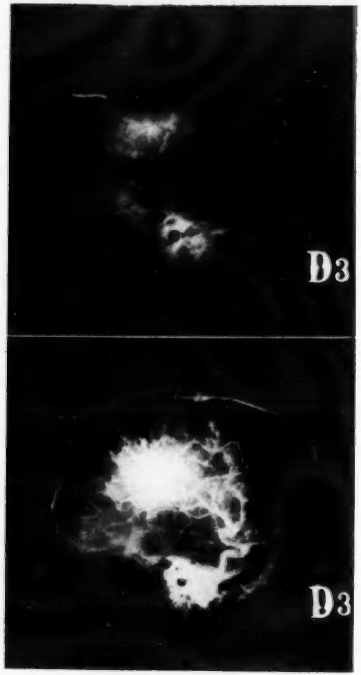


FIG. 13.

Arteriogram (*below*) and phlebogram (*above*) from a case of meningioma. Note how the tumour is outlined.

(By courtesy of Dr S. Lima.)

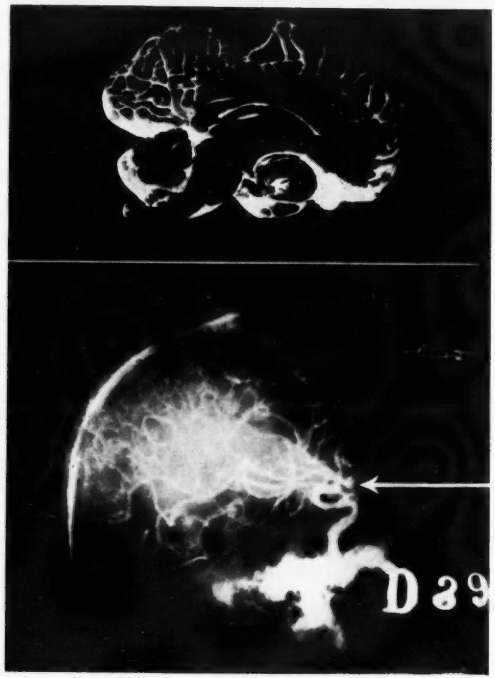


FIG. 14.

Aneurysm, indicated by arrow, of the anterior communicating artery.

(Author's case.)

Arteriogram from a similar case.

PLATE XI

of the cerebral vessels after the injection of radio-opaque thorotrast into the carotid. Its advantage compared with ventriculography is that it does not affect intra-cranial tension and so is less upsetting to the patient. Its major disadvantage is that thorotrast is not inert but is radio-active, and is not eliminated by the body but concentrated in the reticulo-endothelial system. Experimental work shows that it is to some degree carcinogenic; but it must be remembered that in such work the doses are far in excess of those used in this investigation. In selected cases the advantages of the method outweigh its limitations.

Most of the space of this article has been devoted to problems of diagnosis rather than of treatment. This is because many of the problems of treatment are too technical to be of general interest: the real problems are those of exact diagnosis.

PROGNOSIS.

Mortality rate figures may indicate the skill of a surgeon, or merely his timidity or indeed temerity. To open the skull and not to open the dura mater, for example, can hardly be termed an intra-cranial operation: such a surgeon's mortality rate would be negligible, as would be the benefit obtained in a large series of cases. Intra-cranial tumours cannot be considered as a whole. Sir David Ferrier in 1898 wrote: "The treatment of intra-cranial tumours forms a rather melancholy chapter in therapeutics." With regard to the gliomata, especially those of the glioblastoma multiforme type, this statement is still true. It is by no means true of pituitary tumours,

(Author's case.)
Arteriogram from a similar case.
(By courtesy of Dr S. Lima.)

suprapituitary tumours, meningiomas, auditory neurinomas, cerebellar hæmangiomatous cysts, chronic arachnoiditis and the like. (Figs. 15 to 17.)

The bold neuro-surgeon will lose many of his patients, but he will have more real cures. Of the surviving bad cases one may say that the end results should be about as good as for operations for cancer of the stomach, though the operations are more desperate and accompanied by greater risk.

FIG. 15.

FIG. 16.

Case of meningioma of right frontal region. Successful removal. Photograph [on eighth post-operative day.

Tumour from similar case. Fresh weight 3½ oz.

(Author's case. By courtesy of Dr. H. Carleton.)

FIG. 17.

Re-educative exercises following partial removal of the right cerebellar hemisphere for an astrocytoma.

This child should remain cured.

(Case by courtesy of Dr G. F. Sutton.)

PLATE XII

SOME TUBERCULOUS CONDITIONS.*

BY

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DURING the present century there has been a truly remarkable diminution in the incidence of tuberculous disease. There can be no doubt that this has been mainly brought about by preventive measures. It is, in fact, one of the outstanding triumphs of preventive medicine.

The phthisical patient is no longer given a bottle of medicine and allowed to return home carrying infection to his family and associates. He is either isolated in a sanatorium or is taught how to live at home without endangering the lives of those with whom he is in contact, and is kept under supervision throughout the course of his illness.

From the point of view of the patient and the public the results have been excellent; from that of the medical student, however, they have been much less satisfactory. Tuberculous subjects do, of course, still come up to the Out-Patient Departments of general hospitals for investigation; but, once their ailments

* Presidential Address, delivered before the Bath and Bristol Branch of the British Medical Association at Bristol on Wednesday, 28th September, 1938.

have been diagnosed, they are seen there no more, and many students are getting qualified who have had little experience in the diagnosis of tuberculous conditions and none in their treatment.

During the same period considerable changes have also taken place in the treatment of tuberculosis of both the pulmonary and the so-called "surgical" varieties. At the present time the surgeon and the physician co-operate so closely in the treatment of all types of the disease that it is no longer easy to draw any distinction between what is medical and what surgical. In my younger days it was rare indeed for a surgeon to be called in to see a case of pulmonary tuberculosis. Should a child suffering from tuberculous disease of a bone or joint be admitted to hospital, however, the surgeon boldly attacked the case without any preliminary medical treatment. The results were, I regret to say, by no means satisfactory. Now and then an excision or erasion of a joint met with success, but many of the operation wounds broke down and became secondarily infected, with eventual loss of limb or life; while quite a large number of the patients subsequently developed miliary tuberculosis.

It was during the first decade of the present century that the treatment of non-pulmonary tuberculosis in open-air hospitals and by other than operative methods became really popular. There was such a striking improvement in the results, together with a great diminution in the mortality, that for a time the operative treatment of tuberculous bones and joints almost disappeared. Non-operative methods still reign supreme, but of recent years certain operative measures have been introduced which have lessened the period of invalidism and have considerably improved the final results. Surgical methods as applied to the

treatment of pulmonary tuberculosis are a comparatively recent development. The field is limited, but the results in suitable cases are undoubtedly very satisfactory. In the present paper I propose to confine myself to some observations upon tuberculosis of the hip, the spine and the lungs.

TUBERCULOUS DISEASE OF THE HIP.

The vast majority of cases occur in children during the first ten years of life. The condition seems particularly rare in adults. Once the disease is *well established* there is little difficulty in effecting a diagnosis. The text-book description and a good skiagram should leave little doubt as to the nature of the trouble. It is in *the very early case* that doubts not infrequently arise; and it is at this stage, when bone changes are few, that treatment should be instituted if the best results are to be obtained. Delay must increase the period of invalidism and mar the final result.

The symptoms are fairly constant. In almost every case a child is brought to see one on account of a limp, which has usually been present for some weeks. There may or may not have been some pain in this early stage. If present it is much more often referred to the knee than to the hip, and many a time have I seen cases in which an inexperienced house surgeon has examined and radiographed the knee when the real trouble has been in the hip joint. Mistakes of this kind are much less likely to occur if one insists upon stripping every child who has a limp. As the child walks it will then be seen that there is some flexion at the hip joint, a sign which is absent in cases of painful knee. When the child is examined supine the hip flexion is often masked by lordosis, but if this is

overcome by persuading the child to put its sound knee to its mouth the flexion immediately becomes apparent. In addition to the flexion there is present some asymmetry of the two limbs. In early cases the thigh is usually abducted and outwardly rotated. The child should then be turned upon its face, and first the sound and then the affected limb be lifted off the couch by grasping the child's ankle. Loss of hyper-extension is very readily demonstrated by this manœuvre. Another early and very constant sign is wasting of the thigh muscles.

X-ray Appearances

The absence of any bone changes does not mean that the case is non-tuberculous. The primary lesion may be synovial. The most constant changes are :—

1. Loss of symmetry: the affected hip being abducted and rotated out.

2. Decalcification of the bony structures forming the joint. Do not forget that the disease may start in the acetabulum and that the innominate bone may be the first to show rarefaction.

3. Loss of joint space.

4. Blurring of the bony outlines, suggestive of a poor skiagram. These early changes may easily be overlooked unless both hips are taken on the same plate, a precaution which should NEVER BE NEGLECTED.

There are a few not uncommon conditions which mimic an early tuberculous hip. Coxa plana and slipped epiphysis should be readily differentiated by means of a skiagram. A limp, together with flexion of the hip, may be due to an inflamed inguinal gland or to psoas spasm caused by retrocaecal appendicitis

or pelvic inflammation. A careful physical examination should serve to differentiate these. Poliomyelitis may give rise to a limp, wasting of the thigh muscles and decalcification of bone: but the history, the presence of free and painless hip movements and probably evidence of muscular wasting elsewhere should save one from making a mistake.

The condition which I find most difficult to differentiate is a temporary synovitis due to some other cause. The history is generally a short one; the pain and limp may have followed a cold or sore throat and there is no muscular wasting. In a case of this kind one must withhold judgment. Treat the case as a possible tuberculous infection; put the child to bed for a week or two and then re-examine. The rest will have made little difference to a tuberculous case, but a synovitis due to other causes will generally have cleared up completely and left no signs of any disability.

Treatment.

This consists first in measures designed to increase the general powers of resistance. Of these the chief are complete rest in bed, good food, sunlight and nursing day and night in the open air. The value of the stimulant action of air in movement striking upon the exposed body is not as much appreciated as it should be. The addition of this one factor to the treatment of a child who has been nursed in a hospital ward makes a truly remarkable difference to its well-being. The appetite increases by leaps and bounds, the cheeks become rosy, and the whole temperament of the child alters.

Local treatment consists in traction upon the limb till any deformity has been corrected, followed by

complete immobilization till healing is complete. Different methods of fixation are adopted at different hospitals. I do not propose to discuss their merits and demerits in the present paper.

During the treatment of these cases the complication most likely to arise is abscess-formation. In this event no immediate operation is called for as quite a large number of abscesses are spontaneously absorbed. But should the skin threaten to become involved the abscess should be aspirated through a good thickness of healthy tissue. The aspiration should be repeated as often as necessary. In spite of treatment sinuses will develop in a few cases and in them the most meticulous care must be taken to avoid mixed infection. This is, of course, a disastrous occurrence. At the best it will seriously prolong the period of invalidism; at the worst it may be followed by loss of life or limb.

One of the most difficult problems to decide is: "How long must one continue treatment?" Two definite rules can be laid down upon this point. First, all pain and muscle-spasm must have been absent for several months. Secondly, X-ray examination must show not only that the disease has ceased to spread, but that recalcification is taking place, as evidenced by increased bone density and improved definition. Even when satisfied upon these points one must proceed with great caution. At first the child should be allowed up for a short time each day with the hip fixed in plaster. If all goes well the "up" time is slowly increased, and eventually some weight-bearing is allowed, still with the hip fixed in plaster. Should there be any sign of a flare-up, such as a return of pain in the hip or knee, back the child must go to bed for some further months of rest and immobilization.

PLATE XIII

FIG. 1.

Extra-articular graft.

PLATE XIV

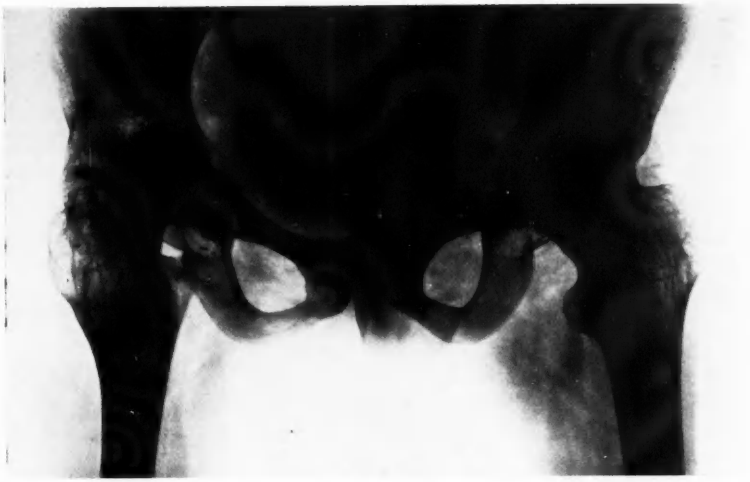

FIG. 2.

Bony ankylosis of both hip-joints.

FIG. 3.

Operative production of Pseudarthrosis.

A mobile hip joint is never to be expected. What one hopes for is bony ankylosis in a good position. In a great many cases the ankylosis is fibrous and this may lead to bitter disappointment. So often a child is discharged from hospital with the hip in excellent position only to return later with flexion, adduction and internal rotation, and perhaps by that time bony ankylosis in this faulty position. If such should be the case an osteotomy is imperative. Without this treatment the patient will go through life with a bad limp and wearing a high boot. An osteotomy, on the other hand, will correct any apparent shortening and will permit the patient to walk with scarcely any perceptible limp. It is to avoid this disappointing development of late deformity and also to expedite healing of the tuberculous lesion that the operation of extra-articular arthrodesis has become popular of late years. As usually practised nowadays, a large bone graft is turned down from the ilium and inserted into a slot made in the great trochanter. The first skiagram (Fig. 1) will show the result of such an operation. The second skiagram (Fig. 2) shows a case in which bony ankylosis of both hip joints has taken place. In this instance the child was unable to get about until I had formed a false joint by dividing the neck of the femur and inserting between the raw bone surfaces a sheet of fascia lata. She now has about 45 degrees of active flexion and is able to walk with remarkable freedom. (Fig. 3.)

TUBERCULOUS DISEASE OF THE SPINE.

This is much the commonest of all tuberculous infections of the bones and joints. It is quite common in adults as well as in children. The dorsal region is

most frequently affected and it is the site most difficult to treat. The reasons for this are :—

1. That the disease usually commences in the front of the vertebral bodies, and that the spine is kyphotic in the dorsal region : this leads to crushing of the diseased portion of the bone and to an early angulation of the spine ;

2. In the dorsal region the spinal canal is smaller than elsewhere so that any swelling due to abscess formation or granulation tissue very readily causes pressure upon the cord.

Diagnosis.

The commonest symptom is persistent pain usually referred to the back. It is increased by jarring and relieved by recumbency. At times the pain is referred to the chest, the abdomen or the limbs. Now and again a case presents itself in which there has been no complaint of pain at all and which comes up on account of deformity, of abscess formation, or even of paraplegia.

When first seen some deformity is not uncommonly already present. Usually there is local rigidity of the spine and pain is elicited when the affected part is jarred. In early cases the diagnosis is frequently in doubt till a good skiagram has been obtained. An early lesion is much more easily detected in a lateral than in an antero-posterior skiagram. In the latter the earliest sign is a narrowing of the intervertebral disc.

Very many cases have been treated for months as sciatica or lumbago, and I would urge my fellow medical men not to diagnose these diseases till every effort has been made to exclude other possible causes of pain. Occasionally referred pain has given rise to

suspicion of some abdominal complaint such as cholecystitis, appendicitis or gastric ulcer. Scoliosis should not cause confusion, as tuberculosis gives rise to angulation rather than to rotation. Spondylitis deformans and malignant disease can be differentiated skiagraphically.

Treatment.

In the case of children this consists in recumbency till the disease is not only arrested but healed. This may mean several years; never less than one. No external splint will prevent the diseased vertebrae being crushed together if the patient is in an upright position. With disease in the lumbar and lower dorsal regions I treat my patients prone in a plaster bed. When it occurs above this level the patient is better nursed supine, in a plaster bed which should extend upwards to include the head and neck.

In the case of adults the period of invalidism can be considerably shortened if the diseased vertebrae are fixed together by a bone graft: but this operation should be deferred till the disease has become quiescent. I always treat my adult patients by a few months recumbency in the open air till their resistance has been raised and all pain has disappeared, and then insert an Albee bone graft. The operation is not a serious one. With a good assistant it can be carried out in half to three quarters of an hour, and is not followed by any shock. Some three months later it is generally possible to allow the patient to sit up, and the majority are able to return to work about a twelvemonth later.

The chief complications likely to arise in cases of tuberculous spine are:—

1. Paraplegia. This usually clears up with rest. Should it develop when the patient is supine it will

often disappear if the patient is nursed prone and *vice versa*. The most troublesome cases are those which develop when the tuberculous disease is of long standing and apparently quiescent. In many such there is present an abscess the pus in which has become inspissated or calcified. (Fig. 4). Such an abscess is commonly situated in the posterior mediastinum and needs to be evacuated before the paralysis will clear up. To effect this, the level of the abscess must be accurately determined and the corresponding transverse process and rib base cut away. This allows access to be obtained to the front of the vertebra, when the pus may be scooped out. The operation is generally very successful. (Fig. 5.)

2. Abscesses in other situations may need aspiration, but the majority are gradually absorbed.

PULMONARY TUBERCULOSIS.

In my early days when I still had plenty of time on my hands I became interested in the treatment of unilateral pulmonary tuberculosis by the induction of artificial pneumothorax. Tuberculosis in other parts of the body had been found to respond so satisfactorily to rest that it seemed sensible to adopt the same principle in the treatment of pulmonary cases. Dr. Campbell Faill had recently come to Bristol, and together we carried out the first series of cases in these parts. Of course this mode of treatment is extensively employed at all sanatoria at the present day.

There are cases in which generalized adhesions render the induction of an artificial pneumothorax impossible and others in which localized adhesions render it unsatisfactory by preventing the collapse

PLATE XV

FIG. 4.

Paravertebral abscess ("butterfly"). Before operation.

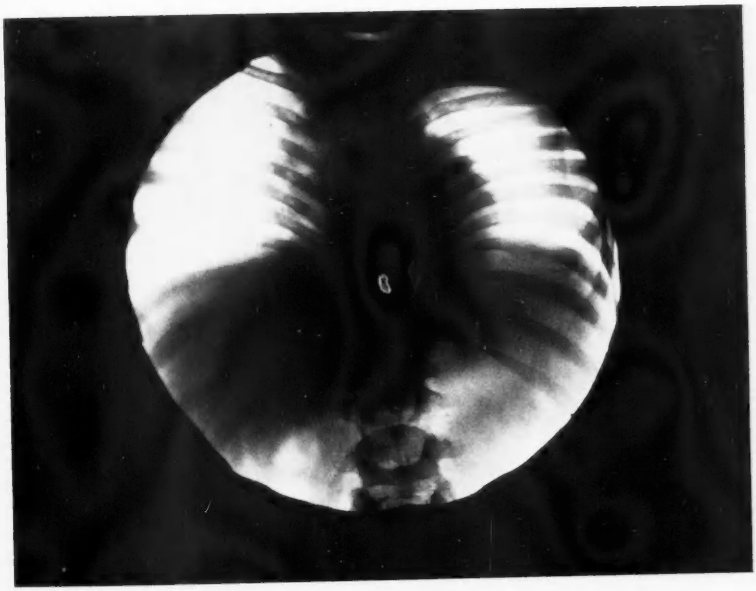

FIG. 5.

Same case after operation.

PLATE XVI

FIG. 6.

After thoracoplasty.

of cavities. In such a case the patient still suffers from persistent cough and expectoration and from the effects of toxic absorption. Where adhesions are small they may be divided by means of a cautery or by diathermy. This operation is not devoid of risk, because there may be an extension of a cavity into the adhesion itself, and it may inadvertently be opened when the adhesion is divided. This in turn may lead to the production of an empyema, possibly with fatal results. It is well, therefore, to limit oneself to small adhesions and to divide them as close as possible to the chest wall.

Where basal adhesions are present a phrenic evulsion, by paralysing the diaphragm, allows it to rise and so to counteract the effect of the adhesions. The operation is a simple one which is carried out under local anæsthesia. Perhaps on this account, it seems to be very popular with physicians. The same operation is also of value at times in putting a stop to recurrent hæmoptysis.

When extensive adhesions are present more radical methods are adopted for putting the lung at rest. Of these the two most commonly employed are apicolysis and thoracoplasty. In apicolysis the parietal pleura is freed from the upper part of the chest wall to enable the upper part of the lung to collapse. The space thus formed is filled with paraffin wax. It is an excellent operation, but has two drawbacks; the first that the foreign body may gradually be extruded; the second that it may give rise to septic infection.

For my own part I have a preference for the operation of thoracoplasty. This consists in the removal of large portions of the fixed ribs, from their spinal attachments outwards and including their

angles. This enables the chest wall to fall inwards. If it is desired to collapse the upper part of the lung only, it suffices to attack the upper five or six ribs. Where a more extensive collapse is required the operation is carried out in two stages, the upper five ribs being removed two or three weeks before the remainder. The operation produces remarkably little constitutional disturbance when one considers its magnitude. The results are excellent, and it is surprising how little deformity is noticeable when the patient is clothed. (Fig. 6.)

THE VITAMIN B COMPLEX.

BY

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INTRODUCTION.

ALTHOUGH scurvy, beriberi, rickets and pellagra have been known for centuries, the discovery of diseases due to vitamin deficiencies dates only from the beginning of this century. It is true that Lind (1753) made some admirable observations on scurvy; that Stark in 1769 twice induced the disease in himself by careful dietetic experiments (as a result of which he died); and that Michael made excellent attempts to isolate the antiscorbutic principle early in the eighteenth century. Further, Lunin (1881) clearly recognized that small quantities of unknown substances were essential to life, and Pekelharing (1905) demonstrated the existence of diseases due to dietary deficiency. Yet it was Hopkins (1912) who first realized the full significance of vitamins. Since then their number has increased with such rapidity that it is a year or two since the discovery of vitamin T was claimed; vitamin B has been split into some dozen

possible factors, and about two new papers on vitamins B and C are published each day of the year.

Much of this work will not stand a critical analysis, and it is obvious that the clinician cannot hope to be fully conversant with the scientific work being done in this field. It is the object of this paper briefly to summarize recent work, done mainly upon animals, on the vitamin B complex, and as far as possible to indicate applications of this work.

The term " water-soluble vitamin B " was originally used for the antineuritic vitamin discovered by Eijkman in 1897. During the last twelve years it has been shown that this factor is multiple. Vitamin B_2 was distinguished in 1926 as a factor which prevented pellagra and was more heat-stable than vitamin B_1. Vitamins B_3, B_4, B_5 and B_6 were later recognized; all are water-soluble and present in fresh yeast, and all are necessary for the nutrition of pigeons or rats. Confusion then arose. Rats fed on a diet deficient in vitamin B_2 failed to grow and developed a dermatitis, and this was believed to be analogous to pellagra. When the fluorescent compounds called flavins came into prominence in 1933, it was found that one of these (riboflavin) could be isolated from preparations of vitamin B_2 and would promote growth in rats adequately provided with vitamins B_1, B_4 and B_6. But pure riboflavin was found to have no effect upon this dermatitis of rats or upon human pellagra; it was obvious, therefore, that vitamin B_2 must consist of more than one factor. In 1935 it was shown that the factor which prevented rat dermatitis was vitamin B_6, and so for the rat vitamin B_2 consisted of riboflavin

and vitamin B_6. Neither of these components, either alone or in combination, cured human pellagra, and therefore the original "vitamin B_2" (which, of course, had never been isolated pure) consisted of at least three factors: riboflavin, vitamin B_6, and the P-P (pellagra-preventive) factor, now believed to be nicotinic acid or a derivative (see p. 185). These factors are all adsorbed on fuller's earth, but there is a fourth factor necessary for the growth of rats and chicks which is not adsorbed (and called on this account the "filtrate factor"). These four factors make up the vitamin B_2 complex.

Vitamins B_3, B_4 and B_5 are not known to have any clinical significance, and other alleged constituents of the vitamin B complex (such as factor W, choline, vitamin H, and the "anti-gizzard-erosion factor for chicks" described by Bird *et al.* (1936)) need not detain us from the more detailed consideration of vitamin B_1 and the vitamin B_2 complex.

VITAMIN B_1.

Clinical Considerations.

More than fifty years ago Baron Takaki deduced that beriberi was of dietary origin, and, by adding more meat and vegetables to the diet of Japanese sailors and by partly replacing the customary rice by wheat and barley, greatly reduced the incidence of the disease in the Japanese navy. Despite the mass of work which has been published upon the clinical manifestations of deficiency of vitamin B_1, this is still a frequent cause of illness and death in such countries as China, Japan, Brazil, the Philippine Islands and some parts of the United States. Gross

deficiency is undoubtedly rare in this country, but mild and subclinical states are probably fairly common.

In man symptoms of deficiency begin and progress somewhat as follows. First there is loss of appetite, with lack of energy, muscular weakness and "heaviness" of the legs; this is followed by tenderness of the calf muscles, and "burning" of the soles of the feet with loss of vibration-sense in the legs. The paræsthesiæ in the legs become more marked, the weakness increases and is perhaps accompanied by intermittent claudication, and the Achilles and patella reflexes become weak and later absent. The weakness spreads to the extensors of the toes, then of the foot and next to the extensors and flexors of the leg. Toe- and foot-drop are therefore found. At the same time there is hyperæsthesia followed by anæsthesia advancing up the leg. Atrophy of the muscles and skin occurs. The upper extremity is usually affected later. The central nervous system is rarely involved, but the memory is usually defective. Some authors consider that both Korsakov's psychosis and the toxic amblyopia of alcohol- and tobacco-addicts are due to deficiency of vitamin B_1.

So far as cardiovascular symptoms are concerned, dyspnœa, "palpitations" and tachycardia are found. Later the heart dilates. The arterial pressure is usually normal and the pulse pressure slightly increased. The circulation rate is increased because the peripheral small vessels are dilated; and this dilatation is the probable cause of the œdema, which may be mild or extreme. Death finally occurs from heart failure.

At autopsy very few pathological changes are usually found except the dilatation of the heart. In

chronic cases there is marked degeneration of the myelin sheaths of peripheral nerves ; this commences in the periphery of the long nerves and gradually extends towards the cell.

Two factors, acting either singly or in conjunction, may be responsible for the occurrence of hypo-vitaminosis B_1 :

(i) Inadequate ingestion of the vitamin ;

(ii) Failure to assimilate the vitamin.

Each of these will be considered in turn.

1. *Inadequate Ingestion.*

Cowgill[1] (1934) has shown that the body weight and the total metabolism or calories are two important variables determining the requirement of vitamin B_1. Beriberi is commonest among young adult males because their metabolism is higher than that of females. The breast-fed infant is next in order of susceptibility. The incidence among women is less, and among the elderly and the aged beriberi is comparatively rare. Since the metabolism is raised during pregnancy, and since it has been shown that lactating animals require three to five times more vitamin B_1 than normal ones, it is not surprising that women become more susceptible to beriberi during pregnancy and lactation. Several workers have suggested that the polyneuritis of pregnancy is due to deficiency of vitamin B_1 ; Strauss and McDonald (1933) cured not only the polyneuritis but also the *hyperemesis gravidarum* in many of their cases by generous doses of yeast. Authors have recently reported relief

of this condition by administration of vitamin B_1, and have advised its regular use in pregnancy. In pregnancy it has even been used for inducing labour and afterwards for increasing the period of lactation!

Any other factor, apart from pregnancy, which increases metabolism will increase the susceptibility to deficiency of vitamin B_1. The literature contains numerous reports of beriberi following prolonged fevers, and this association has led some clinicians to adopt the view that beriberi is an infection and not a dietary deficiency. Polyneuritis occasionally accompanies influenza, typhoid fever, leprosy, rabies, smallpox, and chronic pulmonary tuberculosis; vitamin B_1 is stated to be effective in post-influenzal neuritis and in the neuritis of leprosy. One might expect to find symptoms of deficiency occasionally in cases of hyperthyroidism (although such patients usually take a liberal diet); such cases have been recorded, and Means has recently quoted Weiss's opinion that "vitamin B deficiency . . . may explain why some patients with hyperthyroidism have cardiac dilatation and cardiac symptoms."

Actual deficient intake in otherwise normal people is undoubtedly rare in this country. Those people who, for financial reasons, are on low diets, have low caloric intakes, and therefore (as Cowgill has shown) they tend not to develop polyneuritis. It is for that reason that polyneuritis is very rare in cases of *anorexia nervosa.*

"Alcoholic" polyneuritis is now believed to be due to deficiency of vitamin B_1 and not primarily to a "neurotoxic" effect of alcohol. Goodhart

and Jolliffe[2] (1938) have finally proved this. The subjects of this form of polyneuritis take a high caloric diet in which most of the energy is supplied by alcohol; as no form of spirits contains any vitamin B_1, these individuals suffer a deficiency. This deficient intake may be exacerbated by the presence of achlorhydria or hypochlorhydria in about 80 per cent. of patients with the disease (Minot) since hypoacidity is alleged to prevent the assimilation of the vitamin.

Other forms of polyneuritis have been claimed to be due to deficiency of vitamin B_1. Vorhaus, Williams and Waterman (1935) treated one hundred unselected cases of multiple and localized neuritis of diverse ætiology with vitamin B_1; it was claimed that only eight failed to show improvement, forty-four being cured and forty-eight improved. Toxic forms due to arsenic, lead, thallium, mercury, and nicotine have all been claimed to be improved by treatment with vitamin B_1. Such claims seem extravagant, especially in regard to heavy metals such as lead, which produce a polyneuritis clinically different from that caused by deficiency of vitamin B_1. Good effects of vitamin therapy have been reported by several authors in various forms of neuritis (localized, acute, post-diphtheritic, etc.); improvement has been claimed in sciatica and even in disseminated sclerosis. These claims are extravagant and fanciful. All that can be said is that deficiency of vitamin B_1 undoubtedly causes true nutritional polyneuritis, "alcoholic" polyneuritis and possibly polyneuritis of pregnancy and of diabetes (gastrogenous polyneuritis will be treated below).

2. *Failure to assimilate vitamin* B_1.

This may be due to (i) failure to absorb the vitamin (ii) destruction in the gut, or possibly (iii) failure to phosphorylate it.

Many cases of deficiency of vitamin B_1 have achlorhydria, although this is not caused by the vitamin deficiency. It has been suggested by many workers that cases of pernicious anæmia might be partially deficient, and that subacute combined degeneration is due to chronic deficiency of vitamin B_1. Analyses of blood which I have done during the last two years lend no support to this view. However, I have found low values in some cases of idiopathic hypochromic anæmia, which is, of course, sometimes caused by nutritional deficiency of iron, sometimes by failure to absorb the iron owing to achlorhydria. In idiopathic hypochromic anæmia we probably have the same two causes tending to produce low vitamin B_1 in the blood as we have in the case of "alcoholic" polyneuritis, namely deficient intake and deficient absorption. But in the cases with anæmia, unlike the others, the intake is not markedly deficient and so the blood values do not fall so low. Possible deficiency of vitamin B_1, probably through failure of absorption, has been observed in other disorders of the gastro-intestinal canal, such as after gastro-enterostomy, entero-enterostomy, gastrectomy, in ulcerative colitis and in chronic bacillary dysentery.

Apart from failure to ingest or absorb the vitamin, deficiency is possible through its destruction in the gastro-intestinal canal. A number of cases of poly-neuritis secondary to pyloric stenosis have been

described, and I have found low B_1 blood values in three such cases.[3] It seems probable that prolonged fermentation in the dilated stomach in an alkaline medium causes destruction of the vitamin, particularly since it is known to be unstable in presence of alkali. Indeed, it is possible that deficiency in the other cases of achlorhydria mentioned above may be due to actual destruction of the vitamin rather than to failure to absorb it. It should be mentioned, however, that Ungley's case[4] of polyneuritis secondary to pyloric stenosis had hyperchlorhydria. Of course the vitamin may be lost through vomiting, but in several cases described the neuritis preceded the vomiting.

Chemistry and Mode of Action of Vitamin B_1.

The chemical work done in various laboratories led finally to the synthesis of vitamin B_1 by Williams and Cline in 1936, and also by others. The molecule contains a pyrimidine and a thiazole ring (Fig. 1).

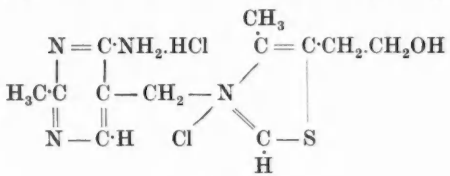

FIG. 1.

Vitamin B_1 hydrochloride.

The way in which the vitamin acts in the body has been worked out mainly by Peters (see *e.g.* Peters,[5] 1936). Using pigeons and rats, he has shown that when vitamin B_1 is deficient, lactic and pyruvic acids accumulate in the body, because they are formed

from carbohydrate but cannot be further broken down. Avitaminous brain tissue *in vitro* is unable to oxidize pyruvic acid, but does so when minute amounts of B_1 are added. Normal tissue oxidizes pyruvic acid and is unaffected by additional B_1. It therefore seems that vitamin B_1 is necessary for the oxidation of pyruvic acid in the body:

$$\text{Glucose} \longrightarrow \text{lactic acid} \xrightarrow{+O} \text{pyruvic acid} \xrightarrow{+O} CO_2 + H_2O$$

$$\uparrow$$

$$\text{vitamin } B_1$$

This work on lower animals is confirmed by the study of patients with beriberi. Japanese workers showed that lactic acid accumulated in the body in this disease, and more recently Platt and Lu[6] (1937) have shown that the same is true of pyruvic acid. This biochemical change occurs particularly in the brain, and this goes far towards explaining the symptoms of beriberi. Pigeons which are moribund (blind and opisthotonic) from acute deficiency of vitamin B_1 recover completely within half an hour of the injection of the pure vitamin. The change producing these symptoms must obviously be biochemical, for no structural lesions can be demonstrated by ordinary histological methods of staining. It seems that the biochemical change in the nerve cells is sufficient to explain the peripheral neuritis of beriberi, because if the metabolism of the nerve cell is disturbed the neurone will be affected distally at first. It is not surprising, therefore, that the early symptoms occur as a result of changes at the distal end of the long nerves. The fact that the respiration of the auricle is also

lowered in deficiency of vitamin B_1 helps to explain the cardiac manifestations.

Pure vitamin B_1 is now readily available for therapeutic use, either orally or parenterally. It is certain that there is no danger of overdosage or cumulative toxic effects, since a therapeutic dose of 5 mg. intravenously is about 1/7,200th of the toxic dose. Intravenous administration of as much as 100 mg. is without untoward effects. It would seem advisable to administer the vitamin by injection if there is doubt about its efficacy by mouth; for instance, Badger and Patrick found little effect on the neuritis of leprosy after oral administration, but good results after intramuscular injection. Treatment should be started with intramuscular or intravenous injection of from 20 to 50 mg. daily. Later the same dose may be given orally, or the injections decreased to 10 mg. daily until the patient is completely relieved of symptoms.

VITAMIN B_2 COMPLEX.

It has already been stated that vitamin B_2 is now known to consist of at least four factors: riboflavin, vitamin B_6, filtrate factor and nicotinic acid.

Riboflavin, which has been synthesized and has the formula shown in figure 2, is necessary for growth in various animals and probably man. It prevents certain disorders in rats (such as conjunctivitis, alopecia, cataract* and even pediculosis), and

* It has recently been claimed that cataract is due to deficiency of vitamin B_1, since in human lenses with cataract the amount of this vitamin is very low and the amount of pyruvic acid is much increased.

dermatitis in turkeys. So far, it has no human significance. It is present in yeast, milk and liver, and is destroyed by light; it will be further mentioned on p. 187.

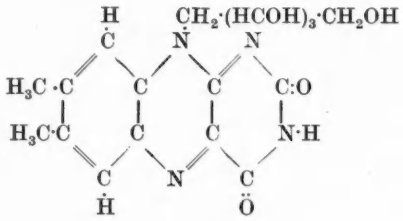

FIG. 2.
Riboflavin.

Vitamin B_6 has recently been crystallized, but its formula is not yet known. In rats it prevents a symmetrical dermatitis which is called "rat acrodynia" because it is alleged to resemble pink disease in children. It may be mentioned that pink disease is believed by many to be a deficiency disease. There is as yet little or no evidence in favour of this view, and it seems rather more probable that the primary cause will prove to be a virus. This very interesting disease cannot be further discussed here; it may be remarked, however, that in our present state of ignorance about the ætiology, it would be wise to administer a yeast preparation. Dried powdered brewers' yeast is a convenient source of the vitamin B complex; about 30 g. daily is a reasonable dose for an adult. It is easily administered stirred into milk, or in warm water with salt.

Pellagra is very rarely recognized in this country,*

* An American colleague with considerable experience of pellagra in America recently saw a tramp with pellagrous dermatitis in a London bus.

although still common in some parts of America. The symptoms may be summarized as weakness and lassitude, anorexia, diarrhœa, sore ulcerated mouth and ulcerated atrophic tongue of a fiery red, mental changes and typical cutaneous lesions. These latter consist of a very characteristic dermatitis on the exposed surfaces, of lesions about the genitalia, seborrhœa on the face and neck, and hyperkeratoses over bony prominences (particularly the elbow). The story of the discovery of the P-P factor may briefly be summarized. Warburg and von Euler showed that nicotinic acid amide is the active group in two important coenzymes. This led to its use in other fields, and late last year Elvehjem and others showed that it cured "black-tongue"—a disease of dogs analogous to pellagra. Several groups of workers immediately tried it and certain related compounds in cases of pellagra, and there seems no doubt that the disease can be completely cured by the oral administration of nicotinic acid (Fig. 3) or its amide; coramine, which is a related compound, is also effective (Spies *et al.*, 1938).[7] It is interesting to note that the peripheral neuritis of pellagra is not relieved by nicotinic acid, but is cured by vitamin B_1. Pellagra is occasionally seen in this country accompanying ulcerative colitis, and recently nicotinic acid has been tried in this latter condition. The acid is cheap, and the dose recommended by Spies is a total of 500 mg. a day, given by mouth in doses of 50 mg. The dose is carefully stated because it must be emphasized that, unlike vitamin B_1, nicotinic acid is definitely toxic, large amounts producing flushing, burning and

itching of the skin, and increased motility of the stomach.

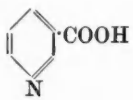

FIG. 3.
Nicotinic acid.

Enzymes, Coenzymes and Phosphorylation.

There is a striking connection between certain members of the vitamin B complex (and one or two other vitamins) and coenzymes or enzymes. An enzyme is an organic catalyst which is a protein ; a coenzyme is a non-protein organic compound which is fairly specific and associated with an enzyme in nature. Enzymes are believed to consist of an active (" prosthetic ") group, which is often unstable, joined to or part of a protein. If the prosthetic group is stable and becomes detached from its carrier, it may easily be mistaken for a coenzyme. It is probable that some coenzymes are nothing more than the active part of the enzymes. The composition of some coenzymes is known ; two which are important in cell respiration and fermentation contain nicotinic acid amide (see p. 185) combined through phosphate molecules with adenosine (a nucleoside). It has recently been shown by Lohmann that the coenzyme " cocarboxylase " (which catalyses the breakdown of pyruvic acid) is nothing else than vitamin B_1 combined with two phosphate molecules. Further, it is believed that riboflavin acts in the body combined with phosphate ; and a factor which was shown by Warburg to be

important in cell respiration (and is sometimes called the "yellow enzyme") consists of riboflavin joined through phosphate to protein. Hence we have at least three members of the vitamin B complex (B_1, riboflavin and nicotinic acid amide) combined in the body with phosphate to form coenzymes or (if protein be attached) enzymes which are important in cell respiration or metabolism. By analogy with riboflavin it is tempting to believe that vitamin B_1 diphosphate is not merely the coenzyme which is necessary for the degradation of pyruvic acid, but is the active part of the enzyme which catalyses this degradation. In support of this hypothesis, I have recently found that neither vitamin B_1 nor the diphosphate exists free in blood, but that the vitamin is combined probably with protein.

Verzár[8] has stressed the importance of phosphorylation in the body. He has shown that fatty acids and certain carbohydrates are absorbed from the intestine at an increased rate by being combined with phosphate in the cells of the intestinal mucosa. For this process to occur the presence of riboflavin phosphate is necessary, and for riboflavin to be phosphorylated the hormone of the adrenal cortex is necessary. He maintains that adrenalectomized animals show a large decrease in the "yellow enzyme" in their livers, and can be caused to grow by being fed with riboflavin phosphate. Further, since he believes that fatty acids are not absorbed from the intestine unless phosphorylation can occur, he suggests that cases of idiopathic steatorrhœa, sprue and cœliac disease should be treated with the adrenal cortical hormone or with riboflavin phosphate. This work, however, is still in

the experimental stage. But the possibility should be borne in mind that symptoms of deficiency of vitamin B_1 (or of other factors) may arise, not through actual deficiency of the vitamin, but through failure of it to be phosphorylated (and possibly combined with protein). Vitamin B_1 is phosphorylated in the liver (Ochoa and Peters) and possibly also in the intestine (Tauber). Apparent B_1 deficiency occurs occasionally in cases of cœliac disease and sprue, and has been described in liver disease.

Anæmia and the vitamin B complex.

A relation between the vitamin B complex and various forms of anæmia has been repeatedly claimed since 1929. Castle and Strauss (1932) stated that "vitamin B_2" or a closely related substance was the extrinsic factor in pernicious anæmia, but this was later discarded. More recently it has been shown that pigeons on a synthetic diet develop an anæmia which is cured by yeast but not by vitamins B_1 or B_6 or riboflavin. Clutterbuck, Evans and Wills (1937) consider that a factor related to the vitamin B_2 complex cures nutritional anæmia in monkeys; it has been stated that the filtrate factor is concerned. György has produced aplastic anæmia with symptoms of hæmorrhagic diathesis in rats by dietary means, and cured it with nicotinic acid. Others have produced a severe microcytic hypochromic anæmia in puppies by a diet deficient in vitamin B_6. These results are difficult to correlate at present, but they indicate a possible relation between a factor or factors in the vitamin B complex and normal blood formation.

A short time ago vitamins were thought to have a narrow clinical application, being useful only in such classical diseases as rickets, scurvy, beriberi and pellagra. Now the pendulum has swung too far in the opposite direction and there is a danger of diseases not of nutritional origin being treated with vitamin preparations to the exclusion of appropriate therapy; there are instances of cardiovascular syphilis, diabetic neuritis and other conditions being diagnosed as deficiency of vitamin B_1 and treated with the pure vitamin. The rapid advance of laboratory work in this field makes the careful clinical investigation of each case even more important and emphasizes our ignorance of nutritional diseases in man. The relative ease with which several of such diseases can be treated with pure preparations is unfortunately apt to overshadow the important problem of preventing nutritional disorders by ensuring that everyone can consume a well-balanced diet.

SUMMARY.

1. The various factors which compose the vitamin B complex are mentioned.

2. The clinical aspects of deficiency of vitamin B_1, and factors which may cause that deficiency, are described. The vitamin has been synthetized, and it is concerned in the body with the oxidation of pyruvic acid.

3. The four known factors which constitute the vitamin B_2 complex (riboflavin, vitamin B_6, filtrate factor and nicotinic acid) are briefly described. The symptoms and nature of pellagra are mentioned.

4. There is a striking connection between certain members of the vitamin B complex and coenzymes or enzymes. The importance of phosphorylation in the body is stressed.

5. A relation between deficiency of the vitamin B complex and anæmia is indicated.

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THE MEDICINAL WATERS AT BURNHAM-ON-SEA.

BY

J. A. NIXON, C.M.G., M.D., F.R.C.P.

With a Bibliographical Note by R. H. BROWN.

BURNHAM-ON-SEA at the present day is chiefly famed as a seaside resort, with splendid sands and sand-dunes, offering admirable schools and (in partnership with Berrow) possessing a championship golf-course. It also gains some reflected glory by reason of Berrow having been the birthplace of this year's "open" golf champion, Mr. Reginald Whitcombe. Nevertheless, Burnham made its first bid for a place in the sunshine about one hundred years ago by claiming to have medicinal waters and by the foundation of a spa.

The Bristol Medical Library has recently purchased a small book, which does not figure in the Surgeon-General's *Index Catalogue* of the Army Medical Library, Washington, nor in those of the Royal Colleges of Physicians or Surgeons in London, nor of the Royal Society of Medicine.

The work is entitled *An Historical Account of the Medicinal Waters or Mineral Springs of Daviesville, at Burnham, near Bridgwater*, by George Henning, M.D., published at Bridgwater by George Awbrey, Fore Street, 1836. The author was one of the physicians of the Taunton and Somerset County Hospital. He

published another book, *The Critical Inquiry into the Pathology of Scrofula*, which is possessed by the libraries above-mentioned, and other works designated "etc., etc." on the title page which I have not been able to identify.

The book is a small octavo volume of 115 pages (+xii), bound in blue leather, with the title on the back *Burnham Spa*. The quality of the printing is exceptionally good for the time. A clear and well-cut type face shows to good advantage with careful spacing and generous leading between the lines. The impression is very even, and with a few exceptions, the colour excellent and uniform. Many a product of modern letterpress machinery compares badly from a technical point of view with this example of the work of a small provincial printer of hand-press days. It has been ascertained that George Awbrey was also, at the date of this book, secretary to the Baptist Church at Bridgwater, and it is known that four or five printers have employed his premises in Fore Street since his days, the present occupants being Messrs. W. H. Smith & Son, with a small printing works behind their stationery shop.

The first chapter describes the situation and amenities of Burnham. The Preface opens with the assumption that the Daviesville Spas were already well known.

"The Daviesville Spas, having already acquired great celebrity in the district where they were discovered, it is thought proper to make them more generally known." Of the composition of the waters it is stated:

"Chalybeate waters, which give momentum to the pulse, elasticity to the muscular tissues, appetite to the stomach, strength to the digestion and vigour to the

whole animal fabric are well entitled to the term of tonics or strengtheners. This property, being possessed by one of the spas at Daviesville in combination with laxative and other ingredients, admits of its being designated both tonic and aperient."

In this respect the writer would class the water as saline, pointing out that of other saline spas, Cheltenham alone shows similar chalybeate impregnation.

The second of the Daviesville Spas contains "some of the characteristics of a sulphurous impregnation" which would admit of its "being classed with the waters of Harrogate, and Moffat, of Aix-la-Chapelle and Enghien." By artificially "raising the temperature of the sulphureous spa at Daviesville to a parity with that of Barège or Aix," and by increasing its sulphur content, "it undoubtedly may be made equal to those very celebrated springs in point of medicinal efficiency." [One begins to suspect that the "waters" of Daviesville needed a good deal of "fortifying."] "In other complaints where the psychrolusia alone is required, it may be had in apartments, in all respects convenient and comfortable, and either in the form of the shower, or the plunging bath, and of spring water, or that of the sea, warm or cold."

"Psychrolusia" seemed an unfamiliar term in hydrotherapy, but it figures in the latest edition of Dorland's *Medical Dictionary*—"psychrolusia, bathing in cold water: *psychros*, cold; *louein*, to wash." The analysis of the water reveals that it was turbid and slightly yellow; "the smell was very offensive, resembling that of a cesspool, mixed with an odour not unlike bad horseradish." After this frank statement it seems almost irrelevant to mention that it contained muriate of soda, sulphates of magnesia and soda,

carbonate of lime, oxide of iron, silex, and vegetable matter. It was apparently very slightly effervescent.

This healing water, which, as the author says, "seemed to possess rather a putrid flavour," was not found flowing from a natural spring. The Reverend David Davies, vicar or stipendiary curate of Burnham, recognizing many points of strong resemblance between the earth of Daviesville and that of Cheltenham, sank a well which at a depth of seventy-five feet "arrived at the spring, which proved to be a mineral water, possessing active medicinal properties, but fortunately contained in a vehicle not repugnant to the most fastidious palate." Truly, our grandparents had strong palates. However, the vicar sank another well a short distance from the first and struck the same water at a depth of only twenty-five feet.

Thus provided with a medicinal water that was not repugnant to the most fastidious palate, Mr. Davies proceeded to develop a spa, to which he gave the name "Daviesville."

"On the western side of the Churchyard and intervenient to it and the Beach is the Esplanade or Terrace, which fronts the hamlet of Daviesville. It extends itself along the coast northward and is computed to be two hundred yards in length and thirty in breadth. . . . Mr. Dodd has led the way by building two tasteful Cottages in . . . the cottage style on the Sandhills, in a line with Daviesville and about half-a-mile distant from it northward. They are in the hamlet of Paradise. . . . The terrace of Daviesville is bounded and upheld by a Sea-wall of masonry of great substance and strength. . . . On this terrace stands the original Pharos or Lighthouse: the great feature of the place and the cynosure of the waters. . . . This eminently important though homely structure was erected in the

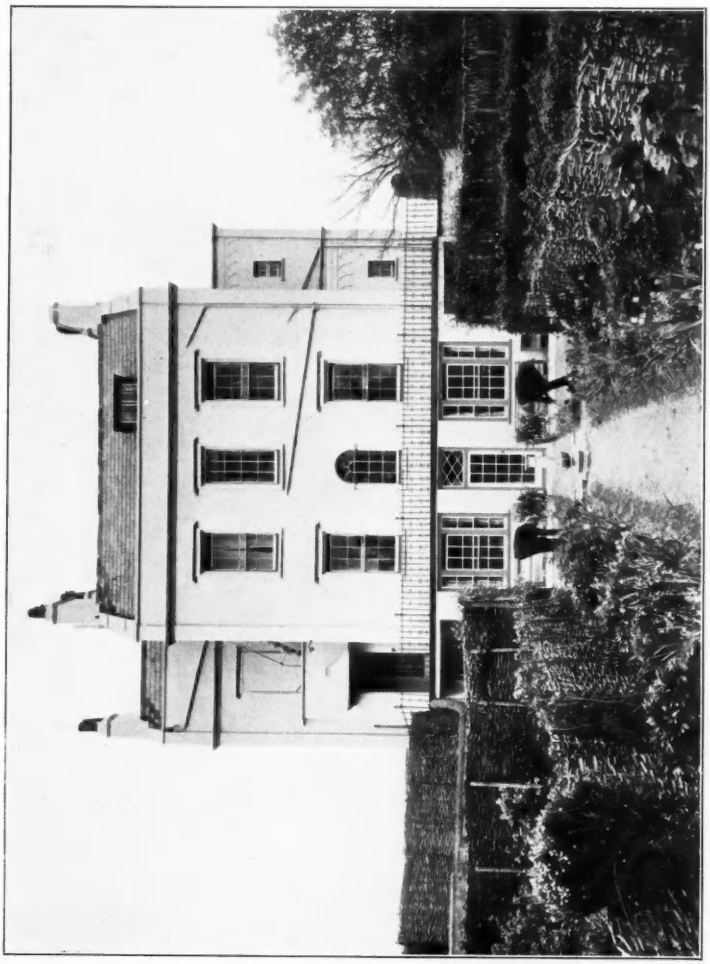
STERT HOUSE

STERT HOUSE

ESPLANADE FRONT

PLATE XVII

PLATE XVIII



STERT HOUSE

GARDEN FRONT

first year of the present century, at the sole cost and risk of the Reverend David Davies."

"It was the erection of this building," says the author, "that raised Burnham from obscurity. It drew strangers to the place and those of quick perception saw intuitively that it was a land of promise."

In the hamlet of Daviesville a Bath House was built, fitted with sea water baths and the hot baths of the sulphurous spring. Facing the Bath House was "the Machinery for raising the sea water and conveying into cisterns for the supply of the cold and warm baths." There was also an unexpected amenity, viz.: "Cisterns or beds for the feeding and fattening of oysters. The oysters being in the first instance brought from Wales" and fattened by the addition of oatmeal or barley meal to the water. "The constant supply of them at the customary prices cannot fail to be a great acquisition to the neighbourhood and in particular to invalids, to whom it is a nutritious article of diet, and a restorative in emaciating diseases. And here I may be permitted to add that it is the intention of the Reverend gentleman . . . to plant oyster beds in suitable parts of the Bay of Bridgwater."

Dr. Henning gives the distance of Burnham from Bath, Bristol, Glastonbury, Taunton and Bridgwater, with some directions for reaching it, and closes Chapter I with the information: "The Hotel is now about to be re-opened with every convenience; and at Whitburn's Livery Stables, a fly and Bath chair are kept for the use of Visitors. In the Pump Room is a moderate selection of books for general reading, with a London newspaper. There is a post daily. For the accommodation of those individuals who may prefer bathing in the sea at high water, suitable machines are kept, with proper attendants."

GARDEN FRONT

There are thirteen chapters in this little book but the remaining twelve deal with the composition of water in general and the healing properties of medicinal waters. The diseases which the Daviesville waters will cure are set forth with the assurance customary amongst prospectus-writers; but the author rises above the ruck by including a disquisition on wearing flannel next the skin. His conclusion is truly judicial: "Now this, as it seems to me, is the *cardo rei*, the precise point to be settled; not whether flannel shall not be worn next the skin when existing circumstances, such as a disproportionate determination of blood to the lungs, a defect of the insensible perspiration or a proneness to the attack of catarrh, require it; but whether having been resorted to, it is at all events to be employed during the rest of life? I think not . . . it enfeebles the frame in delicate persons, especially during the summer months, and more particularly at night. I have, therefore, without hesitation advised the discontinuance of it, and I never knew any harm result."

A charming book, full of appreciation of the climate and sand-dunes of Burnham, that has settled all disputes on the merits of flannel next the skin and brought to light the full-sounding term "psychrolusia" for cold bathing!

A small booklet entitled *Burnham, a Royal Domain of King Alfred*, written and illustrated by Margery B. Sanders, A.R.M.S., gives another account of Burnham Spa:—

> Few but the old people remember that for a time Burnham became quite famous as a mineral water spa. It owns a sulphur spring, and a saline chalybeate spring, both very valuable. They are now in the kitchen gardens of the Hall, once the

residence of Mrs. King, widow of the late Bishop King, and conveyed to her in 1827. These wells were dug and found by the Rev. David Davies. He was a man of science as well as a benefactor of his sea-side village, and used the money he had received for the rights of his light-house to sink these wells. He was sure the soil showed the existence of saline chalybeate, and was rewarded not only by finding that, but a strong flavour of sulphur also. A second well was sunk and another spring of sulphur was soon discovered. Delighted with his find, he had a Bath House erected, and people began to pour from all over the country to this little place, and even drove in carriages and pairs from Wales to drink and bathe in the mineral waters. The Bath House is still standing, now called Steart House, and is a large Georgian building on the esplanade. The wells are between it and the Berrow Road, with big stables, and pretty wooded gardens which were planted for the patients' use. One delightful path, wooded and gay with flowers, was called till quite recently the Green Walk, and would have come out nearly opposite the footpath across the Berrow Road to Brent Knoll. It is now a private garden and the wells themselves are also in private possession.

Doctor Beverley Morris, who was the last doctor to work them, constantly received letters speaking of the curative power of these waters. An old judge who travelled extensively used to send to him for the bottled water, even when abroad, saying that nowhere else could he get anything so health giving.

There is no printer's name or date of publication in Miss Sanders' pamphlet, but one of the illustrations bears in addition to the author's initials the date 1927.

Mr. Chowins, the Surveyor to the Burnham Urban District Council, states that during 1938 there was a suggestion made that the Spa might be revived.

With this in view the water from one of the wells was analysed and condemned on the ground of heavy

contamination with *B. Coli.* The Bath House was recently (27th June, 1938) sold by auction under its present name of Stert House. It is situated near the church with two entrances on the esplanade, and a carriage-drive from the Berrow Road. Between Stert House and the church, on the esplanade, in a short row of houses, stands a small house called "The Round Tower." Part of this house consists of the lower portion of the Pharos or old Lighthouse, which was built by the Rev. David Davies in 1800.

Reviews of Books

The Doctor's View of War. By H. JOULES, M.D., M.R.C.P. Pp. i., 122. London: George Allen & Unwin Ltd. 1938. Price 3s. 6d.—The authors of this book are recommended by the editor as a well-assorted group, covering a very wide field of medical practice. Unfortunately, the field of war is not included in their medical experience. Their facts are derived from literature, not from experience. However, to do them justice, they have epitomized the official medical history of the War quite well. Milton might have had them in mind when he spoke of "the ferrets and mouse-hunts of an index." Like other sane human beings, they deplore the arbitrament of war, but they have visions of a conference of the Medical Societies of the world pronouncing that for the sake of humanity a system of collective security must be established which might prevent war. As a practical contribution to the promotion of peace this seems rather slender.

A Synopsis of Physiology. Third Edition. By A. RENDLE SHORT, M.D., B.Sc., F.R.C.S., and C. L. G. PRATT, M.D., M.Sc. Pp. viii., 325. Illustrated. Bristol: John Wright and Sons Ltd. 1938. Price 10s. 6d.—Physiology is a subject which cannot be curtly summarized with satisfaction; but if this method of treatment is in any degree possible, Rendle Short and Pratt's *Synopsis* certainly makes a brave attempt to present facts and arguments concerning body processes in a concise form, and one must admire the degree of success attained. It is remarkable how much information has been fitted into about three hundred small pages; in this edition the material is reasonably up-to-date in all the important branches of Physiology. The book is probably most useful to students wishing to revise their knowledge of Physiology in a short time; the telegraphic style which is necessary for brevity will probably not worry them, though it would no doubt become irritating to practitioners wishing to keep abreast of the subject, who would fare better with a more expansive text-book. The account of conditioned reflexes is

unnecessarily short, and there is no mention of the mechanisms which increase the output of insulin. Amongst the few other criticisms are the consistent misspelling of the word adrenaline, the omission of Benedict's qualitative test in favour of the less sensitive Fehling, an apparent misconception regarding the nature of Mett's tubes and an implication that the *reflex* control of the heart can be studied in the heart-lung preparation (although three pages later it is pointed out that such a heart has lost its normal nervous control); and occasionally one comes across bald teleological statements which, after all, do not explain functions. The format and type are excellent and well suited to the purpose of the book.

Common Happenings in Childhood. By Sir G. F. STILL, K.C.V.O., M.D., LL.D., F.R.C.P. Pp. x., 180. London: Oxford University Press. 1938. Price 5s.—This book consists of a series of essays or studies of such common events in childhood as crying, laughter, sleep, appetite, tiredness and the like. It is the product of the clinical experience of an outstanding pædiatrician who studied children as well as their diseases. It is not a text-book, but rather a happy blending of scientific observation, philosophic reflection and common-sense advice. No claim is made that any of the subjects are treated either exhaustively or systematically. The book is valuable not so much for what it says, as little of this is new, but for the approach to children that it portrays. It is clearly written and easy to read, so that although primarily intended for doctors and nurses, it can be recommended to anyone who is seriously interested in the welfare of children.

Arthritis, Fibrositis and Gout. By C. W. BUCKLEY, M.D., F.R.C.P. Pp. viii., 153. Illustrated. London: H. K. Lewis & Co. Ltd. 1938. Price 7s. 6d.—Dr. Buckley has written a very good book on chronic rheumatic disease and gout. There was every reason why he should have done so, because of his long experience of these diseases in practice and because, as editor of the Reports on Chronic Rheumatic Diseases issued by the British Committee on Rheumatism, he has the opportunity of learning (by discussion and reading) the latest views of other workers in this field. His descriptions and classification are good, whilst his survey of remedial measures is first-rate. This is a most practical book, in which treatment

is considered with judgment and described with concise but adequate detail. It will be found a very useful guide in practice.

Reports on Chronic Rheumatic Diseases. No. 4. By C. W. BUCKLEY, M.D., F.R.C.P. Pp. xii., 155. Illustrated. London: H. K. Lewis & Co. Ltd. 1938. Price 10s. 6d.—This volume is the last annual report of the British Committee on Chronic Rheumatic Diseases. The work has now been taken over by the Scientific Advisory Committee of the Empire Rheumatic Council, and in future reports will appear more frequently. This fourth report contains many and varied articles, mainly on treatment. Professor Stanley Davidson opens with a discussion on the social aspects, maintaining that the voluntary hospitals are unable to cope with the problem. Dr. Philip Hench of the Mayo Clinic writes on how they tackle arthritis and rheumatism in the U.S.A. Dr. Mathieu-Pierre Weil, of Paris, contributes an interesting article on radio-active substances and the treatment of rheumatism. There are critical reviews on vaccine treatment and on gold therapy. Professor Mitchell, of Edinburgh, illustrates comparative clinical and pathological features in "Rheumatic Disease" in the horse. One of the most comprehensive chapters is that by Dr. Kersley of Bath on "The Causation and Treatment of Sciatic Pain." The final chapter is a useful but all too brief survey of the physiological action of some physical methods by Sir Leonard Hill and Dr. H. J. Taylor.

Heart Disease and Pregnancy. By C. BRAMWELL, M.D., F.R.C.P., and E. A. LONGSON, M.B., Ch.B., D.P.H. Pp. xii., 194. Illustrated. London: Oxford University Press. 1938. Price 8s. 6d.—This book is the record of 350 cases of organic heart disease in pregnancy studied by the authors, together with the conclusions reached as a result of this study. All but twenty-five of the cases were observed during the ante-natal period, throughout labour and the puerperium, and many of them have been followed up to date. Not the least interesting result of this study is the conclusion that "although auricular fibrillation does undoubtedly add to the risk of pregnancy, it does not constitute a bar to pregnancy, provided that the patient can be kept under observation and receive adequate treatment." This book serves a most valuable function in that it gives sound information on a most important and difficult subject. Providing as it does a complete guide to the

investigation, management and prognosis, both immediate and late, of heart disease in pregnancy, it should find a place on the bookshelves of all practitioners interested in midwifery.

A Guide to Anatomy. Fourth Edition. By E. D. EWART. Pp. xii., 342. Illustrated. London: H. K. Lewis & Co. Ltd. 1938. Price 12s. 6d.—This book, by a non-medical author, is written especially for the use of students of massage, and that it has fulfilled its purpose in the past seems to be indicated by the fact that the edition under notice is the fourth. It contains an enormous amount of information on the subject with which it deals, necessarily condensed but sufficiently full for the purpose. In fact, it contains so much that one cannot help sympathizing with the student who has to learn so much detail of a difficult subject. The facts are presented in a simple way, and the accuracy of the statements made is such that not a single error can be found after a very close scrutiny. The illustrations are well-chosen and adequate for the purpose, and the index is complete. Altogether it may be said that this book should provide the student of massage with all the anatomical knowledge she requires presented in a way which could not be bettered.

Medicine for Nurses. By C. B. PERRY, M.D., F.R.C.P. Pp. xi., 211. Edinburgh: E. and S. Livingstone. 1938. Price 5s.—This book is of convenient size, clearly and well printed. The general arrangement of the subject-matter is good. The preface states that the book is intended to aid study "for the Final Examination of the General Nursing Council without describing diseases in detail." Facts, therefore, often seem to be dealt with in a vague and inadequate manner, *e.g.*, page 164, Anterior Poliomyelitis. The pathological lesion is not described, nor is the type of paralysis mentioned. It would seem that much space has been given to subjects already dealt with in text books for the Preliminary Examination, *e.g.* Parasites. It is a pity that no illustrations likely to be helpful to senior nurses are included.

Editorial Notes

The Library Association and Medical Libraries.

THE Library Association held its Annual Week-end Conference of its University and Research Section at Wills Hall from the 16th to 19th September. Among the subjects discussed was the relationship between the libraries of medical societies and Universities. In Manchester and Bristol the medical societies and the hospitals have combined with the University in forming a single medical library. The *Lancet*, in commenting on this, pays our society a generous compliment. "The Bristol Medico-Chirurgical Society," it says, "which has a fine tradition of members eminent in literature as well as in medicine, has consented to hand over its books to the University Library. . . . It is hoped, however, that medicine will soon have a separate block in the University in which the library will again become an independent unit." This hope does not imply a separate administration.

Our medical library is a sufficiently independent unit for all practical purposes. It is true that, like all other sections of the Library, it could advantageously spend more money than is at its disposal. There are great advantages in coming under the general administration of the University Librarian and his competent staff. As a separate library the staffing could never hope to be so complete.

At the moment there is no honorary medical

librarian, but the office may be said to be held in commission by the three professors of medicine, surgery and obstetrics who act in an advisory capacity to the University Librarian.

Mr. W. L. Cooper is no less energetic and interested in the maintenance of an adequate medical library than in the maintenance of the other sections.

This *Journal* owes a deep debt of gratitude to the University Librarian and his whole staff. The *Lancet* concludes its notice of the Conference with the words: "In all medical libraries the staff is called upon to supply references and other material to a greater extent than in the libraries of any other faculty." This is true also of the Bristol Medical Library, and it is only just that we should acknowledge the constant help we receive from Mr. Cooper and in particular from the Senior Assistant, Mr. Roberts, who corrects all bibliographies and references that are appended to papers in this *Journal*. Moreover, he verifies every reference, which is occasionally more than the authors have done!

* * * * *

The International Physicians' Luncheon Club of New York

A MOST cordial invitation is extended to physicians visiting New York to be honoured guests at an excellent international luncheon, at the same time offering the services of the Members of the Club for any information they may desire.

While guests are not requested to make speeches, any useful information they wish to give informally will be greatly appreciated as fostering medical progress and international goodwill among physicians from all over the world.

Luncheon is served at the International Medical Center, 135 East 55th Street, New York, every Tuesday punctually at 1 o'clock and is over about 2 o'clock.

Physicians are kindly requested to inform the Club of their presence not later than 9 a.m. Tuesday by telephoning Wickersham 2–7900, or writing International Physicians' Luncheon Club, 135 East 55th Street, New York.

Obituary

CYRIL GEORGE RUSS WOOD, O.B.E., F.R.C.S.

IT is with great regret that we chronicle the death of Cyril George Russ Wood on 26th September at the age of 69. He was the only son of Mr. Cyril J. Wood, of Bath. He entered the Medical School of University College, Bristol, in 1885, qualified M.R.C.S., L.R.C.P. in 1892 and passed the F.R.C.S. (Eng.) in 1902. He was an Infirmary student and married the daughter of one of the B.R.I. surgeons, Charles Steele. Stimulated by the advice and example of Mr. Richardson Cross, he decided to specialize in ophthalmology, and after holding ophthalmic appointments in Southport he became Honorary Surgeon to the Eye, Ear and Throat Hospital, Shrewsbury, and Honorary Ophthalmic and Aural Surgeon to the Royal Salop Infirmary, as well as several other hospitals in the vicinity of Shrewsbury.

Russ Wood was one of the founders of the Oxford Ophthalmological Congress, and held the office of honorary secretary in 1928, and of Master in 1935. He was President of the Midland Ophthalmological Society. When he retired from practice in Shrewsbury in 1931 he was appointed Assistant Surgeon and Pathologist to the Oxford Eye Hospital and

later Consulting Surgeon. He was a lecturer in the Oxford postgraduate course in ophthalmology and examiner in ophthalmology at Queen's University, Belfast.

Mr. Cyril Walker writes of him as follows :—

"Though I knew Russ Wood forty years ago, when he was working at the Bristol Eye Hospital, it was not until his appointment as secretary to the Oxford Ophthalmological Congress that I had an opportunity of appreciating his sterling qualities. When, in 1928, Bernard Cridland resigned the secretaryship and became "Master" of the Congress, I remember it came as somewhat of a surprise to me that he said he knew just the man to succeed him—Russ Wood. Events fully justified this prediction. He always had the interests of the Congress at heart, and with his alert and active mind he rarely lost an opportunity of securing a contribution from anyone who had been doing important ophthalmic work.

"One of the things which struck me most about Russ Wood was his invariable consideration for the wishes and feelings of others. During my term of office as Master of the Congress he frequently invited my opinion on various questions, but I always felt that he had fully considered the matter and that his judgment was to be relied upon. It was always a pleasure to me to recognize his rather sprawly handwriting, for I knew at once that the letter was from a sincere and valued friend."

The Medical Library of the University of Bristol

WITH WHICH IS INCORPORATED

The Library of the Bristol Medico-Chirurgical Society.

LIBRARIAN'S REPORT FOR THE YEAR ENDING 31ST JULY, 1938.

The Medical Library now contains 25,814 bound volumes. During the year 282 bound volumes have been added. These include 39 from the Michell Clarke Fund, 7 from the Munro Smith Fund and 14 from the Library Grant. 56 volumes were received for review, representing a value of £39. 141 volumes were presented. 232 current periodicals are received. Other supplementary material for the Library has been purchased from the General Library Fund. 23 volumes have been withdrawn (i.e. previous edition replaced by current edition). 1,226 books have been borrowed for home reading (this includes periodicals), and 34 have been borrowed from Lewis's.

The following donations have been received since the publication of the list in July, 1938.

Carnegie Institution (1)	2 volumes.
Professor J. A. Nixon (2)	1 volume.
Dr. E. Schjøtt-Rivers (3)..	1 ,,
Professor M. W. Travers (4)	1 ,,
Mr. E. Watson-Williams (5)	1 ,,
Dr. P. Watson-Williams (6)	15 volumes.

Unbound periodicals have also been received from Professor E. W. Hey Groves, Professor C. Bruce Perry and Dr. J. Odery Symes.

THE ONE HUNDRED AND SIXTY-FOURTH LIST OF BOOKS.

The figures in round brackets refer to the figures after the names of the donors. The books to which no such figures have been attached have either been bought from the Library Fund or received through the *Journal*.

Barnhill, J. F., and Wales, E. *Principles and Practice of Modern Otology* .. .. (6) 1907

Benedict, F. G. .. .. *Vital Energetics* .. .. (1) 1938

Bourgeois, H., and Sourdille, M. *War Otitis and War Deafness* (6) 1918

Cathcart, C. W. .. .. *The Essential Similarity of Innocent and Malignant Tumours* .. .. (6) 1907

Colyer, J. F. .. .. *Chronic General Periodontitis* .. .. (6) 1916

Douglass, B. .. .. *Nasal Sinus Surgery* .. .. (6) 1906

Groves, E. W. Hey, and Brickdale, J. F. *Textbook for Nurses* 5th Ed. (2) 1936

Henning, G. .. .. .. *An Historical Account of the Mineral Waters of Daviesville at Burnham, near Bridgwater* 1836

Kerrison, P. D. .. .. *Diseases of the Ear* .. .. (6) 1913

Kyle, D. Braden .. *Textbook of the Diseases of the Nose and Throat* .. .. 4th Ed. (6) 1907

Lack, H. L. .. .. *Diseases of the Nose and its Accessory Sinuses* (6) 1906

McBride, P. .. .. *Diseases of the Throat, Nose and Ear* .. (6) 1892

Maxwell, J. .. .. .. *Introduction to Diseases of the Chest* 1938

Nagel, W. .. .. .. *Handbuch der Physiologie des Menschen* Band 1 1905

Parker, C. A. .. .. *A Guide to Diseases of the Nose and Throat and their Movement* .. .. (6) 1906

Paterson, D. .. .. *Sick Children* .. .. 3rd Ed. 1938

Perry, C. Bruce .. .. *Medicine for Nurses* 1938

Posey, W. C., and Wright, J. (eds.). *A Treatise on the Diseases of the Eye, Nose, Throat and Ear.* Vol. II. (6) 1903

Ritzman, E. G., and Benedict, F. G. *Nutritional Physiology of the Adult Ruminant* .. .. (1) 1938

Ross, Sir R. .. .. *The Prevention of Malaria* .. .. .. (4) 1910

Schech, P. .. .. .. *Diseases of the Mouth, Nose and Throat* (5) 1886

Schjøtt-Rivers, E. .. *Hyperemesis Gravidarum* .. .. .. (3) 1938

Short, A. Rendle, and Pratt, C. L. G. *Synopsis of Physiology* 3rd Ed. 1938

Thomson, W. B. .. *Cancer—Is it Preventable?* .. .. .. (6) 1932

Whiting, F. .. .. *The Modern Mastoid Operation* .. .. (6) 1906

Wright, J., and Smith, H. *Textbook of the Diseases of the Nose and Throat* .. .. (6) 1914

TRANSACTIONS, REPORTS, JOURNALS, ETC.

Janus. First Series, Vols. 1–3. Second Series, Vols. 1–2 1846–1853

Medical Society's Transactions. LXI. 1938

Transactions of the Ophthalmological Society of the United Kingdom. Vol. LVIII. Part 1 1938

Publications Received

From MESSRS. GEORGE ALLEN AND UNWIN LTD.:

The Doctor's View of War. Edited by H. JOULES, M.D., M.R.C.P. Price 3s. 6d.

From MESSRS. H. K. LEWIS & CO. LTD.:

Arthritis, Fibrositis and Gout. By CHARLES W. BUCKLEY, M.D., F.R.C.P. Price 7s. 6d.

Psyche and the Physiologists and other Essays on Sensation. By EDWARD GUY DRU DRURY, M.B., B.S., D.P.H. Price 5s.

A Guide to Anatomy. 4th Edition. By E. D. EWART. Price 12s. 6d.

The Clinical Examination of the Nervous System. 7th Edition. By G. H. MONRAD-KROHN, M.D., F.R.C.P. Price 8s. 6d.

Reports on Chronic Rheumatic Diseases. No. 4. Price 10s. 6d.

Treatment in General Practice. I. Articles republished from the *British Medical Journal.* 2nd Edition. Price 8s. 6d.

Treatment in General Practice. II. Articles republished from the *British Medical Journal.* 2nd Edition. Price 10s. 6d.

From OXFORD UNIVERSITY PRESS:

Dysmenorrhoea: Its Ætiology, Pathology and Treatment. By ALBERT A. DAVIS, M.D., Ch.M., M.R.C.S. Price 12s. 6d.

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Local Medical Notes

EXAMINATION RESULTS.

University of Bristol.—Students of the University have recently passed the following examinations :—

M.B., Ch.B.—*Supplementary First Examination. Pass :* J. M. Allen, Margot J. Copland, J. Eskell, J. R. V. B. Gibson, J. E. G. Hope-Scott, Mildred I. Pott, T. R. Stephens.

B.D.S.—*Supplementary First Examination. Pass :* F. G. Lloyd, F. M. Warren.

L.D.S.—*Supplementary First Examination. Pass :* G. G. Davis, H. Sheffield.

University of Cambridge.—M.B., B.S. *Third Examination.* (*Part II*). *Pass :* C. H. Bartlett, K. G. Bergin.

Conjoint Board. — L.R.C.P., M.R.C.S. *Pass : In Pharmacology and Materia Medica :* E. W. J. Townsend, Megan E. Jones. *In Medicine and Surgery :* Dorothy E. M. Dickinson.* *In Medicine :* Mabel L. Glenny.* *In Pathology :* Joan E. Mackworth, A. L. T. Beddoe.

L.D.S., R.C.S. *Pass : In Anatomy and Physiology :* J. F. Williams.

The Long Fox Memorial Lecture.—The twenty-seventh Long Fox Memorial Lecture will be delivered at 8.30 p.m. on Tuesday, 15th November, 1938, in the Large Lecture Theatre of the H. H. Wills Physics Laboratory, Bristol University (Royal Fort) (by kind permission of the Vice-Chancellor), by Professor A. M. Tyndall, D.Sc., F.R.S. Subject : " Air as a Conductor of Electricity." The lecture will be suitable to a non-professional audience and will be illustrated by experiments.